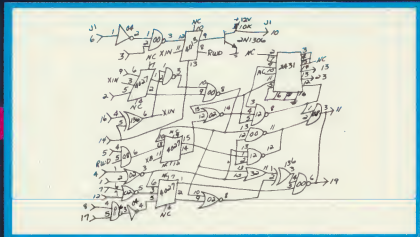


DRAFTING SYSTEM

1

The World's Leader in Computer Schematics
and Automatic Data Base Preparation

FREE-HAND SKETCH



"DS1" allows operator to digitize directly from a free-hand sketch. Enter a "D" size in 1 hour. NO GRIDS. EDITS are performed in minutes. (Summagraphics Digitizer)

COMPUTER PROCESSING

Computers
DG Nova 4X, Eclipse
DEC VAX
UNIVAC
HARRIS
IBM, etc

Computer straightens slanted lines, uses correct size symbols and enters alignments among symbols entered by user during input. Plotter output. (Calcomp 1051)

CONNECTION NET LISTING

AD123789 GENERATED 4/19/80 AT 3:01:00 PAGE 1				
SIGNAL NAME	UNIT	PIN	SHEET	ZONE
N1T001	U1	1	1	A1
N1T001	U1	1	1	A1
N1T002	L1	2	1	A1
N1T002	A2	1	1	A1
N1T003	J1	2	1	A1
N1T003	U2	2	1	A1
N1T004	U2	2	1	A1
N1T004	U3	12	1	A2
N1T005	U2	8	1	H2
N1T005	U2	12	1	C2
N1T005	U11	12	1	D2
N1T005	U7	10	1	D2
N1T005	U4	10	1	C2
RWD	U2	5	1	C2
RWD	U3	8	1	H1
CIN	U2	11	1	A2
XIN	U1	1	1	H2
XIN	U3	4	1	H2
XIN	U4	3	1	H1

BILL OF MATERIALS

BILL OF MATERIALS FOR DRAWING NUMBER AD123789			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	054-4000	SN7404N
2	12	054-002	SN7402N
3	8	054-6080-67	RESISTOR 1.5K 1/2W 5%
4	2	079-5784-1	ZENER DIODE 1N821 6.2L
REFERENCE DESIGNATOR	PART NUMBER	DESCRIPTION	
CR1	079-5784-1	ZENER DIODE 1N821 6.2L	
R1	054-6080-67	RESISTOR 1.5K 1/2W 5%	
U1	054-4000	SN7404N	
U2	054-002	SN7402N	

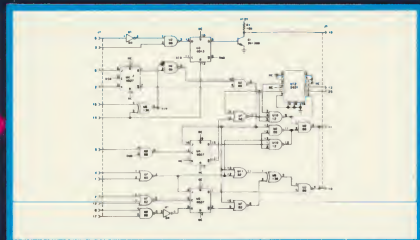
"DS1" automatically provides Net and Bill Lists directly from data base of digitized schematic.

P.C.B. ROUTERS

ASI-PRANCE
AUTOMATE '80
CALMA
REDAC
SCI-CARDS
etc

"DS1" interfaces to P.C.B. Routers, Wire Wrap and Test Programs.

UPDATED SCHEMATIC



"DS1" performs Back-Annotation from a "Was-To" list derived from the P.C. Router. "Back-Annotation" automatically updates the schematic to agree with the circuit board component placement.

DESIGN AIDS inc.

DRAFTING SYSTEM 1

THE MOST POWERFUL

Drafting System 1 is the most powerful because it is the only computer drafting system for schematics, logic diagrams, and chemical process drawings, that performs **layout automatically**. All other systems require that the user lay out his drawing on a grid before it is entered into the system or compose it in gridded fashion on a screen.

With Drafting System 1, the input sketch is truly **freehand** and **non-gridded**. The output is similar to the input in terms of signal flow only. Symbols and lines are moved and straightened to provide an overall minimum drawing size of high quality.

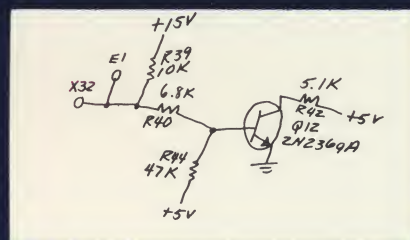
SIMPLE, TIMESAVING OPERATION

1

Freehand Input Sketch

The input is simply the freehand sketch drawn by the engineer.

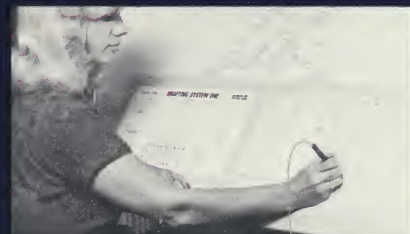
A LAYOUT SKETCH IS NOT REQUIRED.



2

Freehand Sketch Is Entered Using a Data Tablet

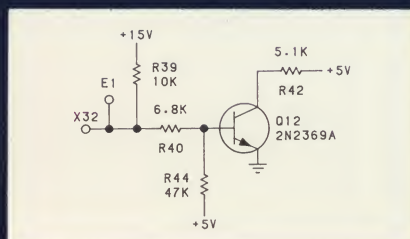
The freehand sketch is entered directly into the computer by the use of a large data tablet. Every time the operator touches a point on this tablet with his stylus, the coordinates of the point are automatically recorded for use by the computer.



3

Layout and Drawing is Done by the Computer

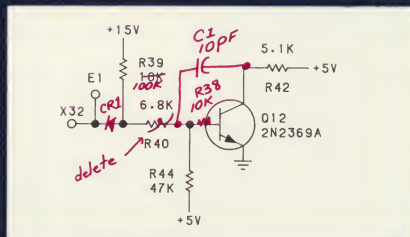
The recorded points are processed by the computer, which does the layout and produces the drawing by means of an attached digital plotter. Drawings of consistently high quality and legibility are produced.



4

Changes Are Easily Made

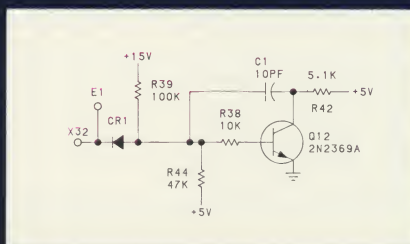
The red-lined changes on the plotted drawing are entered using the data tablet. The computer then re-adjusts the remainder of the drawing accordingly.



5

Updated Final Schematic Drawing

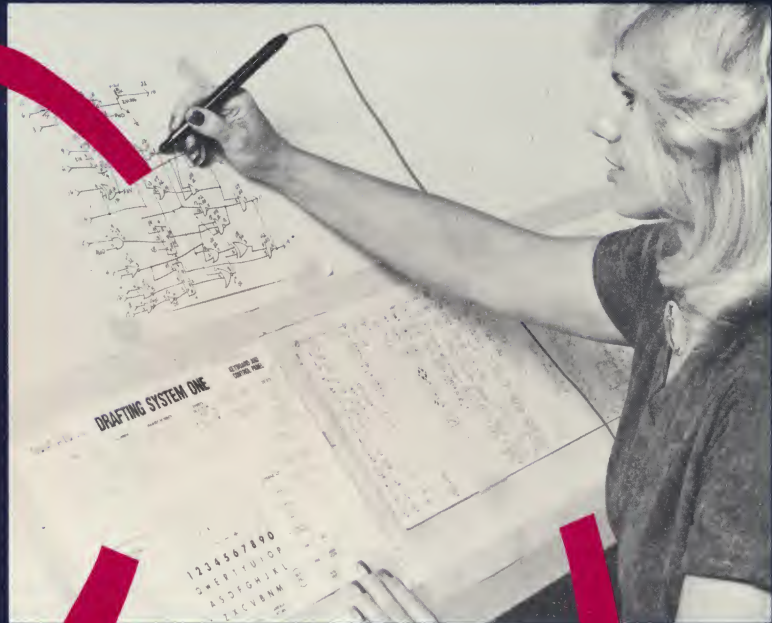
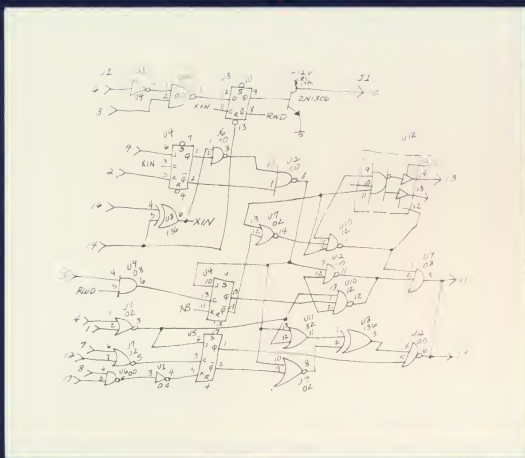
In addition to producing the final plot, the computer can automatically generate a connection list to feed wire wrap programs or printed circuit auto-route programs.



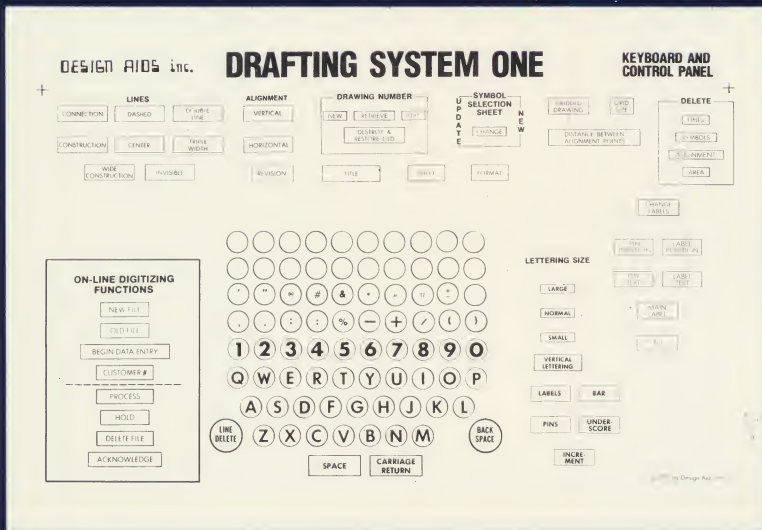
THE EASIEST TO LEARN

The following photos show the simple steps required to input a drawing through the use of Drafting System 1. The operator tapes his rough drawing to the data tablet at any position and any angle. In addition, the operator has two other pieces of paper on his data tablet — a "Symbol Selection Sheet" and a "Keyboard and Control Panel". The Symbol Selection Sheet shows the symbols that he will use in the drawing. These are tailored to the particular application and are easily changed by the operator. If he chooses, he may use several symbol selection sheets for a single drawing. Each sheet may have up to 300 symbols. The "Keyboard" is used to enter text. The average operator can enter text in that way about half as fast as he can type with ten fingers. His overall speed is faster since he uses the same device for both graphic data and text entry.

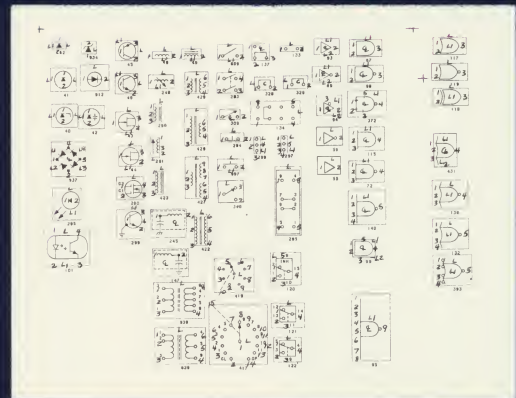
Rough Drawing



Keyboard and Control Panel



Symbol Selection Sheet



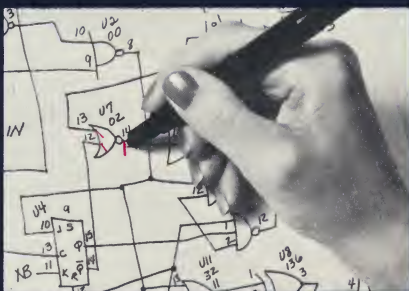
THE EASIEST TO USE

SYMBOLS

Using the stylus attached to the data tablet, the operator enters a symbol by first touching near the symbol in the Symbol Selection Sheet.



He then touches terminals of the symbol in the rough drawing. As he does so, he marks his progress with the red ball point pen in the stylus. The order in which he touches the terminals determines the orientation of the symbol as well. The symbol shown has eight possible orientations — four rotations and four mirror images.



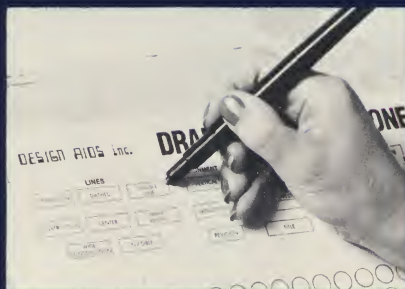
If the symbol has a label, the operator enters it next by touching the letters on the Keyboard. Multiple lines can be entered by touching "carriage return" between the lines. The operator can correct entry errors by touching "backspace" or "line delete".



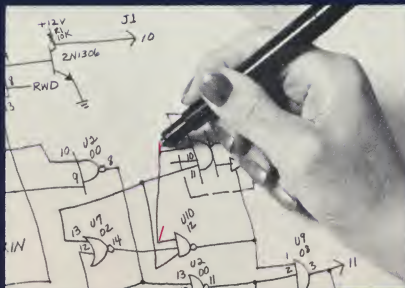
He can now enter any other symbols of the same type without first touching the Symbol Selection Sheet. If the label is the same, he does not have to enter it again. Symbols can be entered in any order.

LINES

To enter a line, the operator first touches one of the line type "buttons" on the control panel sheet.



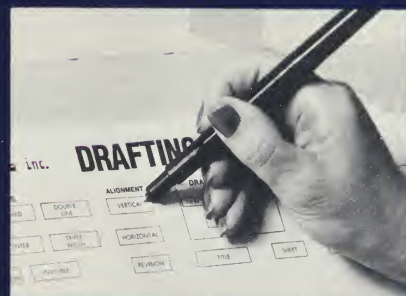
He then touches the end points of a line in the rough drawing.



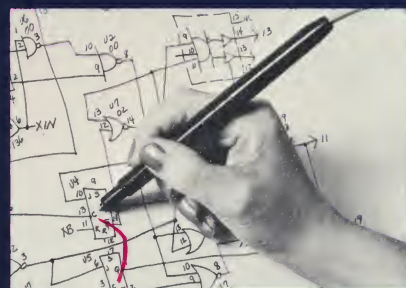
The operator can now enter other lines of the same type without again touching the control panel sheet. The lines can be entered in any order. Symbol and line entry can be mixed in any order.

ALIGNMENT

As the computer straightens lines, symbols on those lines are automatically moved and aligned accordingly. The operator can also align symbols which are not on the same line in the rough drawing. For example, to line up symbols in a vertical column, the operator first touches "ALIGNMENT-VERTICAL" on the control panel sheet.



He then touches near each of the symbols in the rough drawing which are to be aligned.



When that data is later processed by the computer, the symbols which were aligned will be in a vertical line.

THE MOST COST EFFECTIVE

LABOR COST COMPARISONS

FOR A TYPICAL D SIZE SCHEMATIC (NOT ILLUSTRATED)

Method	Labor Hours
Drafting System 1 — Input the rough drawing	1
A computer interactive graphics system — compose on the screen	6
Draw by hand, using rub-ons or templates	12

OTHER COST SAVINGS

Other cost saving information and drawings can be automatically obtained from the computer —

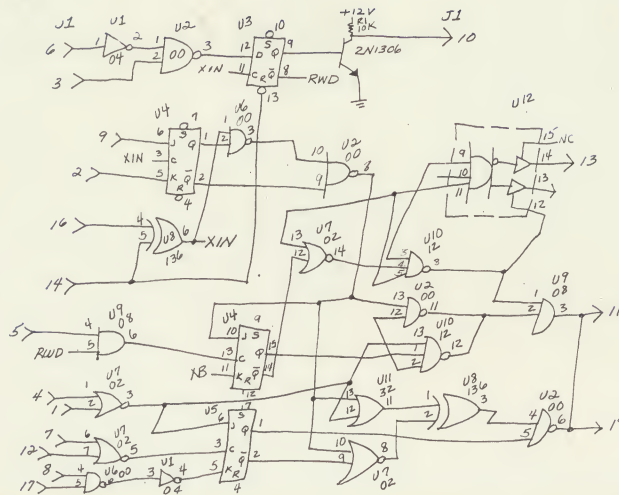
- **Wire List**
- **Bill of materials**
- **Data to feed other design automation programs** such as printed circuit board routing and test generation.
- **Printed Circuit Board layouts** can be prepared in the gridded mode.
- **Panel layout drawings** can be done using the system in gridded mode.
- **Numerically controlled machine tool tapes** can be automatically punched from the panel drawings.
- **Wire wrap tapes.**
- **Flow charts**

THE MOST FLEXIBLE

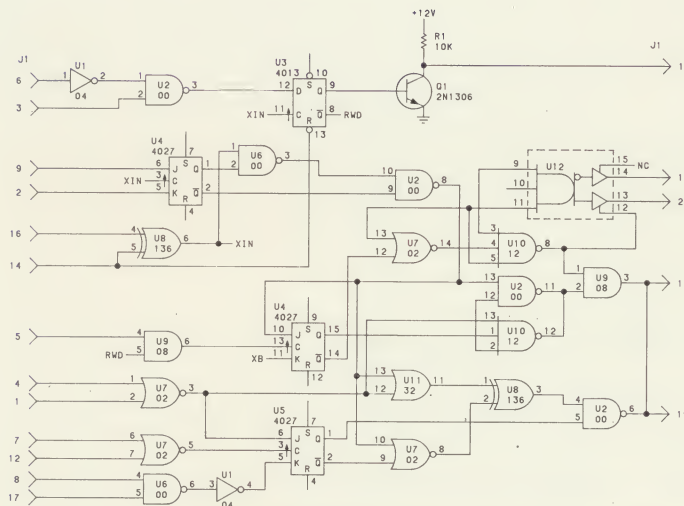
Design Aids will supply a complete system to fill your requirements. We check out and configure the necessary hardware, software and provide all training. If you already have a computer system, we can interface to it or use it. We help you select the hardware necessary for your installation. If you have no existing computer or plotting hardware, we can supply a stand-alone system. A typical

stand-alone system may have one or several data tablets connected either off-line or on-line to the computer. It also has a plotter attached to the computer. Archive storage for drawings is provided by either a magnetic tape unit or a magnetic disk cartridge attached to the computer. Data can also be prepared at remote locations and transmitted to the computer over the phone lines.

A TYPICAL INPUT SKETCH



THE OUTPUT



DESIGN AIDS inc.

27822 El Lazo Road, Laguna Niguel, CA 92677

(714) 831-5611